REMARKS

The applicants appreciate the examiner's thorough review of the application and the prior art, and request reconsideration of the pending claims.

The office action rejected claims 1-5, 7-10, and 12-20 under 35 USC 103(a) as being unpatentable in view of the combination of US 5,986,669 ("Kirkland") and US 6,967,664 (Taylor et al., hereinafter "Taylor"). The office action also rejected claims 6 and 11 on related grounds, and in view of an additional reference.

Generally speaking, various embodiments of the invention improve data throughput in a graphics system by reducing congestion at the input of a graphics processor (e.g., see lines 12-17 of page 5). Accordingly, such embodiments help ensure that the graphics processor receives relevant attribute data only - not attribute data that ultimately will be culled or otherwise not displayed on a display. By minimizing much of the unnecessary attribute data, this innovation more efficiently enables 1) use of the full bandwidth of the graphics processor input for receiving relevant data, and 2) use of the bandwidth of busses between the graphics processor and the source of the attribute data.

As a preliminary matter, Kirkland and Taylor are not properly combinable in the manner suggested by the office action. Specifically, neither Kirkland nor Taylor is directed to reducing congestion at the graphics processor input. In fact, both references have directly contradictory teachings. Specifically, Kirkland teaches reducing rendering demands by increasing clipping/culling related demands (see, for example, column 3, lines 50-55 of Kirkland). Taylor, on the other hand, teaches the exact opposite -by increasing rendering demands to reduce clipping demands (see, for example, column 1, 49-53). Clearly, in addition to solving different problems than those solved by the claimed invention, these conflicting teachings provide no motivation to combine the two references. In fact, they expressly teach away from their combination.

In addition to the lack of motivation to combine the references, both Kirkland and Taylor lack at least one element required by the claims. Specifically, claim 1

defines a method that first determines if a graphic primitive is incapable of being viewable on a display device. Next, the method causes at least a portion of the attribute data to be received by a graphics processor as a function of that determination. In other words, the graphics processor selectively receives attribute data. As an example of this, in various embodiments, the graphics processor input does not receive attribute data if the primitive is to be culled from screen space. This consequently should reduce congestion in both the graphics processor input and the relevant bus.

Neither Kirkland nor Taylor teach such a claimed method. More specifically, neither reference causes attribute data to be received by a graphics processor as a function of whether the primitive data is incapable of being viewable in the graphical image on the display device. To the contrary, the graphics processors in both references each receive attribute data regardless of whether the relevant primitive is to be clipped, culled, or otherwise removed from the image.

In particular, with regard to Kirkland, column 5, lines 21-25 explicitly state that a rendering engine receives "data used to calculate attributes. . ." Although it may ultimately discard this data, the rendering engine (i.e., part of the graphics processor) nevertheless receives such data. The office action agrees with this. The office action continues, however, to suggest that Taylor causes the defined selective receipt of attribute data.

To the contrary, Taylor (like Kirkland) also teaches a graphics processor that receives the attribute data. Specifically, Taylor discusses a primitive processor 80 (figure 3), which the office action explicitly stated is a graphics processor. This graphics processor 80 receives graphical data (which includes attribute data and position data) and determines if it should be discarded before it applies subsequent rendering operations. See, for example, column 4, line 64 to column 5, line 5, which explicitly state that the primitive processor 80 performs the primitive processing functions.

This cited text continues to teach that the functions of the primitive processor 80 may be performed by circuit blocks shown in Figure 5. Further confirming that the

primitive processor 80 is a graphics processor, the circuit blocks in Figure 5 include many functional modules that are in a wide variety of conventional graphics processors. Among others, the processor 80 includes a transform block 210, which explicitly is shown as receiving the object space primitive. In a manner similar to many other conventional graphics processors, the transform block 210 converts the object space primitive to screen space (i.e., referred to as a "clip space primitive 212," assumedly because the primitive was converted to screen space and then clipped relative to the view plane of the display). As discussed in columns 8 and 9, the data forwarded from the transform block 210 (i.e., primitive data, which includes attribute data) eventually reaches a clip processing block 240. After receipt, the clip processing block 240 determines if it will forward the data to the 3D pipeline 250 for rasterization and other discussed processes.

Taylor neither suggests nor teaches selectively receiving the attribute data as defined by claim 1 if the primitive is trivially rejected because, as noted above, such data already is within the graphics processor 80. Accordingly, as stated at lines 6-8 of column 9, attribute data of primitives not trivially rejected (i.e., attribute data already at the clip processing block 240) simply continues to the next functional block of the graphics processor 80; namely, to the 3D pipeline 250.

Claim 1 (and its dependent claims) therefore cannot be considered to have been obvious for the reasons recited in the office action because, among other reasons, neither discussed reference causes attribute data to be received by the graphics processor as a function of whether the primitive is incapable of being viewable on a display device. If neither reference teaches such a method, then their combination clearly cannot teach such a method. Moreover, as noted above, Kirkland and Taylor are not properly combinable.

Accordingly, claim 1 is patentable in view of the cited art. In a manner similar to claim 1, claims 8-20 also have components that require selective attribute data receipt as

discussed above. Accordingly, claims 8-20 also are allowable for the same reasons as discussed above.

The application thus is in condition for allowance and such action is earnestly solicited. The applicants invite the examiner to contact the undersigned, Steven Saunders, if it will facilitate examination.

Respectfully submitted,

Steven G. Saunders
Registration No. 36,265
617-443-9292 (Tel)

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